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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 376,063	08 17 1999	SEIJI ANDOH	OKI-226	5971

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RABIN & CHAMPAGNE, PC
1101 14TH STREET, NW
SUITE 500
WASHINGTON, DC 20005

EXAMINER

DATSKOVSKIY, MICHAEL V

ART UNIT PAPER NUMBER

2835

DATE MAILED: 12 13 2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/376,063

Applicant(s)

ANDOH SEIJI

Examiner

Michael Datskovsky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20, 22, 24-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 20, 22, 24-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other

DETAILED ACTION

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore pursuant to applicant's arguments in the Appeal Brief, the finality of that action is withdrawn and prosecution in this application has been reopened. Applicant's submission filed on 11/26/01 has been entered.

Response to Arguments

2. It is possible to claim only one structure (embodiment) in one independent claim. Therefore the claimed semiconductor device can comprise either a plurality of separate solder bumps or a unitary solder body (no matter how it was made, for a product claim) disposed in a central area of a back surface of a substrate. Because said unitary solder body is mention only as a possible outcome of applying a heat treatment to said central solder bumps, examiner further will consider the claimed structure as having a plurality of separate solder bumps disposed in a central area of a back surface of a substrate. Regarding to the limitation that "said second distance is less than a third distance between said central area and said peripheral area": Applicant has not shown that this particular range is critical by showing that the claimed range achieves unexpected results relative to the prior art range. (In re Woodruff, 919 F. 2d 1575, 16 USPQ2d 1934, Fed. Cir. 1990). To establish unexpected results over a claimed range, applicant should compare a sufficient number of tests both inside and outside the claimed range to show the criticality of the claimed range. (In re Hill, 128 USPQ 197 CCPA 1960). What is more, in the original application applicant has not mentioned this range of sizes at all. (Which deficiency will be addressed in following rejection).

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However, considering recommended in the specification particular small pitch of central bumps which could lead to their further melting together examiner agrees that reference by Barrow is not applicable for the rejection of the instant application.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 20, 22, 24 and 28 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Neither in the description nor in the original set of claims applicant has mentioned second pitch (of the signal solder balls) being less than an intermediate distance (between the central solder balls area and peripheral solder balls area).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 20, 22 and 24-29 as best understood by examiner are rejected under 35 U.S.C. 103(a) as being unpatentable over Katchmar.

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Katchmar teaches a semiconductor device, figs 1-5, comprising: a substrate 12 having a main surface 14 and a back surface 16, wherein said back surface 16 has a central area 32, an intermediate area surrounding said central area 32 and a peripheral area surrounding said intermediate area; a semiconductor chip 18 formed on said main surface; a first bump unit formed of solder bumps 40. Fig. 5, and located in said central area of said back surface, wherein said first bump unit radiates heat from said semiconductor device; a second bump unit formed of solder bumps 24 and located in said peripheral area of said back surface, wherein said second bump unit transmits signals (col.6, lines 50-53), wherein the second bump unit is greater in quantity of solder balls than the first bump unit, and said solder balls are spherical in shape. Katchmar teaches furthermore a first distance between signals bumps being greater than a second distance between heat transferring bumps (col.7, lines 39-47). The limitation that "said second distance is less than a third distance between said central area and said peripheral area" was not considered (See Response to Arguments above).

Regarding to the claims 24, 26 and 28: Although Katchmar does not teach that the purpose of a smaller pitch of central bumps is to allow them to melt together (He teaches a central heat transfer unitary body in the another embodiment in fig 4 made by applying a solder mass), Examiner directs applicant's attention to the fact that including in the product claims a method of making a unitary solder body using predetermined pitch of a plurality of solder balls cannot distinguish his application over the prior art. It is well settled that the presence of process limitations in product claims.

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which product does not otherwise distinguish over the prior art, cannot impart patentability to that product. (In re Johnson, 157 USPQ 670, 1968).

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Datskovsky whose telephone number is (703)306-4535. The examiner can normally be reached on Mn - Fry 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Picard can be reached on (703)308-0538. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-1341 for regular communications and (703)305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

M.D.
December 6, 2001



Leo P. Picard
Supervisory Patent Examiner
Technology Center 2800